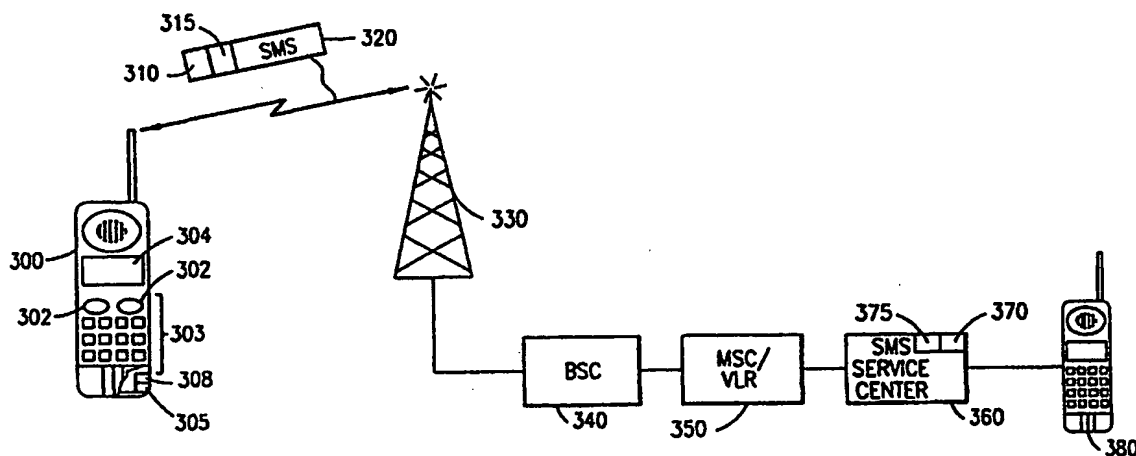




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/US99/07075 <b>(22) International Filing Date:</b> 31 March 1999 (31.03.99) <b>(30) Priority Data:</b> 09/053,568 1 April 1998 (01.04.98) US <b>(71) Applicant:</b> ERICSSON INC. [US/US]; 7001 Development Drive, P.O. Box 13969, Research Triangle Park, NC 27709 (US). <b>(72) Inventors:</b> ALPEROVICH, Vladimir; 18419 Rain Dance Trail, Dallas, TX 75252 (US). BOLTZ, David; 601 N. Glenville #155, Richardson, TX 75083 (US). <b>(74) Agents:</b> MOORE, Stanley, R. et al.; Jenkins & Gilchrist, P.C., Suite 3200, 1445 Ross Avenue, Dallas, TX 75202 (US).		<b>(81) Designated States:</b> AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.          Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>

**(54) Title:** SYSTEM AND METHOD FOR ENHANCED SHORT MESSAGE SERVICE

**(57) Abstract**

A telecommunications system and method is disclosed for organizing SMS messages sent to a mobile terminal based on the location of the mobile terminal or the time of delivery of the SMS messages. Thus, when a subscriber sends a short message to another subscriber, the originating subscriber can specify the time of delivery of the message. In addition, the originating subscriber can specify the priority associated with the message, e.g., the SMS message can have an indication of priority one, which indicates to the receiving subscriber that the message is urgent. Furthermore, the originating subscriber can also specify that the message is to be delivered only when the called subscriber is in a certain location. The receiving subscriber can also control the display of the SMS messages by moving the received SMS messages to an action list, and then specifying when and/or where the SMS messages should be displayed again.

## SYSTEM AND METHOD FOR ENHANCED SHORT MESSAGE SERVICE

### BACKGROUND OF THE PRESENT INVENTION

#### Field of the Invention

5           The present invention relates generally to telecommunications systems and methods for delivering Short Message Service (SMS) messages, and specifically to organizing SMS messages based on the location of the receiving mobile terminal or on the time of delivery of the SMS message.

#### Background and Objects of the Present Invention

10           Cellular telecommunications is one of the fastest growing and most demanding telecommunications applications ever. Today it represents a large and continuously increasing percentage of all new telephone subscriptions around the world. A standardization group, European Telecommunications Standards Institute (ETSI), was  
15           established in 1982 to formulate the specifications for the Global System for Mobile Communication (GSM) digital mobile cellular radio system in use today, and described in more detail herein.

          With reference now to FIGURE 1 of the drawings, there is illustrated a GSM Public Land Mobile Network (PLMN), such as cellular network 10, which in turn is  
20           composed of a plurality of areas 12, each with a Mobile Services Center (MSC) 14 and an integrated Visitor Location Register (VLR) 16 therein. The MSC/VLR areas 12, in turn, include a plurality of Location Areas (LA) 18, which are defined as that part of a given MSC/VLR area 12 in which a mobile station (MS) 20 may move freely without having to send update location information to the MSC/VLR area 12 that  
25           controls the LA 18. Each Location Area 12 is divided into a number of cells 22.

          Mobile Station (MS) 20 is the physical equipment, e.g., a car phone or other portable phone, used by mobile subscribers to communicate with the cellular network 10, each other, and users outside the subscribed network, both wireline and wireless. The MS 20 may also include a Subscriber Identity Module (SIM) card 13, or other  
30           memory, which provides storage of subscriber related information, such as a

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from the Service Center 220 to the MS 200 or from the MS 200 to the Service Center 220.

The mobile terminated SMS 210 transfers a short message from the Service Center 220 to the MS 200. In addition, information about the delivery of the short message is returned to the Service Center 220. This information is either a delivery report, which confirms the delivery of the message to a recipient, or a failure report, which informs the originator that the short message was not delivered and the reason why. If the information is a failure report, the originator has the ability to order retransmission later.

A mobile terminated SMS message typically originates by a user 240 sending a message to the Service Center 220, which then forwards the message to the SMS Gateway Mobile Switching Center (SMS-GMSC) 250. Thereafter, the SMS-GMSC 250 interrogates the HLR 260 for routing information pertaining to the designated MS 200. The HLR 260 returns this routing information to the SMS-GMSC 250, which can then route the message to the MSC/VLR 270 serving the location area (LA) 205 that the MS 200 is in. If the MS 200 is in IDLE mode (not in use), the MS 200 is paged, and a connection is set up between the MS 200 and the network 270, as in the normal call setup case. The MSC/VLR 270 then delivers the SMS message 210 to the MS 200. SMS messages 210 are preferably transmitted on the allocated signaling channel. However, if the MS 200 is in busy mode (in use), the SMS message 210 will be transmitted on the Slow Associated Control Channel (SACCH). In that case, no paging, call setup, or authentication need to be performed.

After the MSC/VLR 270 send the SMS message 210 to the MS, a delivery report is sent from the serving MSC/VLR 270 to the Service Center 220. If delivery of the SMS message 210 was not successful, the HLR 260 is informed, and a failure report is sent to the Service Center 220. In addition, if the delivery was unsuccessful, a Messages Waiting service 215 within the Service Center 220 can optionally provide the HLR 260 and the serving MSC/VLR 270 with the information that there is a message in the originating Service Center 220 waiting to be delivered to the MS 200. Once the MS 200 becomes available for receipt of the SMS message 210, the HLR 260 informs the Service Center 220 and the SMS message 210 is sent again. The

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indicates to the receiving subscriber that the message is urgent. Furthermore, the originating subscriber can also specify that the message is to be delivered only when the called subscriber is in a certain location. The receiving subscriber can also control the display of the SMS messages by moving the received SMS messages to an action list, and then specifying when and/or where the SMS messages should be displayed again.

### BRIEF DESCRIPTION OF THE DRAWINGS

The disclosed inventions will be described with reference to the accompanying drawings, which show important sample embodiments of the invention and which are incorporated in the specification hereof by reference, wherein:

FIGURE 1 is a block diagram of a conventional terrestrially-based wireless telecommunications system;

FIGURE 2 illustrates the delivery of Short Message Service (SMS) messages to and from a mobile terminal;

FIGURE 3 shows the organization of SMS messages based upon the priority associated with the SMS message; and

FIGURE 4 shows the organization of SMS messages based upon the location of the mobile terminal.

### DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EXEMPLARY EMBODIMENTS

The numerous innovative teachings of the present application will be described with particular reference to the presently preferred exemplary embodiments. However, it should be understood that this class of embodiments provides only a few examples of the many advantageous uses of the innovative teachings herein. In general, statements made in the specification of the present application do not necessarily delimit any of the various claimed inventions. Moreover, some statements may apply to some inventive features but not to others.

With reference now to FIGURE 3 of the drawings, an originating subscriber 380 can send a Short Message Service (SMS) message 320 with a priority indication 310 to a receiving Mobile Station (MS) 300, which informs the subscriber associated

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application 308 to display the SMS message 320 at predefined intervals of time, e.g., every hour for six hours, or instructs the SMS-org application 308 to display the SMS message 320 immediately and then display a reminder message 320 at a certain time(s). In addition, the originating subscriber 380 can change the priority 310 of the SMS message 320 based upon the time of delivery. For example, an SMS message 320 can have a priority two indicator 310 associated with it the first time the message 320 is sent, and a priority one indicator 310 associated with it when it is sent a second time (reminder message 320).

Alternatively, the SMS Service Center 360 can have a SMS-org application 370 located therein, which can receive the SMS messages 320 and associated reminder indicators 315 from the originating subscriber 380 and store them in a memory 375 within the SMS Service Center 360 until the time associated with the reminder indicator is reached. Thereafter, the SMS Service Center 360 can send the SMS message 320 to the MS 300 for display on the MS display 304.

If an SMS message 320 is sent from a subscriber 380 that does not have the ability to establish a priority indicator 310, the SMS message 320 will be delivered to the receiving MS 300 without the priority indicator 310. The SMS-org application 308 can then receive the SMS message 320 and display it without a priority indicator 310 at the end of the priority messages 320.

In addition, for SMS messages 320 with priority indicators 310, the SMS-org application 308 can determine the originating subscriber's 380 identity, and if the originating subscriber 380 is not authorized to establish a priority indicator 310, the SMS-org application 308 can discard the priority 310 and display the message 320 at the end of the priority messages 320. Alternatively, the inclusion of a priority indicator 310 with the SMS message 320 can be password protected by the originating subscriber 380, thus preventing any unauthorized priority indicators 310 with delivered SMS messages 320.

With reference now to FIGURE 4 of the drawings, an originating subscriber 480 can send an SMS message 420 having associated location information 470, instead of or in addition to a priority indicator 410, to a MS 400. The location information 470 can include a location area, a set of coordinates, e.g., latitude and

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when the MS 400 is at a specific location. For example, the originating subscriber 480 could send an SMS message 420 saying "Don't forget to stop at the store on the way home," which is delivered immediately and a reminder message 420, which is delivered when the MS 400 enter the location area 490 for the store. Alternatively, both SMS messages 420 (immediate and reminder) can be sent to the MS 400 immediately, and the SMS-org application 408 can display the first message 420 immediately and store the reminder message based upon the reminder indicator 415 and the location indicator 470 until the MS 400 has entered the location area 490 for the store.

Once the subscriber views the SMS message 420, the subscriber has the option of erasing the SMS message 420 from memory 405, storing the SMS message 420 in memory 405 for later retrieval, or moving the SMS message 420 to an action list 406 within the SIM card 405, or other memory. The SIM card 405 can then store the SMS message 420 until a time or location defined by the receiving subscriber occurs. Thus, the receiving subscriber can view the SMS message 420 and place it in the action list 406, instructing the SMS-org application 408 to display a reminder message when a certain time occurs or when the MS 400 has entered a specific location area 490.

As will be recognized by those skilled in the art, the innovative concepts described in the present application can be modified and varied over a wide range of applications. Accordingly, the scope of patented subject matter should not be limited to any of the specific exemplary teachings discussed.

For example, it should be understood that the SMS organization system and method described herein can be applied to any wireless telecommunications system which utilizes short messages, including, but not limited to, Global System for Mobile Communications (GSM) networks, Personal Communications System (PCS) networks, AMPS networks and D-AMPS networks.

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5. The telecommunications system of Claim 4, wherein said service node is an SMS Service Center.

6. The telecommunications system of Claim 1, wherein said respective  
5 indicators associated with said respective short messages are priority indicators.

7. The telecommunications system of Claim 6, wherein said  
organizational node stores said short messages within said memory according to said  
respective priority indicators, said short messages being displayed on said given  
10 mobile terminal according to said respective priority indicators.

8. The telecommunications system of Claim 6, wherein said priority  
indicators are password protected by said originating subscriber.

9. The telecommunications system of Claim 1, wherein said respective  
15 indicators associated with said respective short messages are reminder indicators.

10. The telecommunications system of Claim 9, wherein said short  
messages associated with said respective reminder indicators are stored by said  
20 organizational node within said memory until a time associated with a given one of  
said reminder indicators is reached, said short message associated said given reminder  
indicator being displayed on said display of said given mobile terminal when said time  
is reached.

11. The telecommunications system of Claim 1, wherein said respective  
25 indicators associated with said respective short messages are location indicators.

12. The telecommunications system of Claim 11, wherein said location  
indicators are selected from the group consisting of: latitude and longitude, a location  
30 area, and a geographical reference point.

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indicators within a memory connected to said organizational node; and

displaying, by said organizational node, on a display on said given mobile terminal, said short messages according to said respective indicators.

5           19.    The method of Claim 18, wherein said organizational node is within said memory, said memory being within said given mobile terminal, said step of receiving being performed by said short messages and said respective indicators being sent from said originating subscriber to said organizational node within said given mobile terminal via said mobile switching center.

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20.    The method of Claim 18, wherein said memory is a Subscriber Identity Module within said given mobile terminal.

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21.    The method of Claim 18, wherein said organizational node and said memory are within a service node connected to said mobile switching center, said step of receiving being performed by said short messages and said respective indicators being sent from said originating subscriber to said organizational node within said service node, said step of displaying being performed by said organization node retrieving said short messages and said associated indicators from said memory and sending said short messages and said associated indicators to said given mobile terminal to be displayed on said display of said given mobile terminal via said mobile switching center.

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22.    The method of Claim 21, wherein said service node is an SMS Service Center.

23.    The method of Claim 18, wherein said respective indicators associated with said respective short messages are priority indicators.

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24.    The method of Claim 23, wherein said step of storing is performed by said organizational node storing said short messages and said respective priority



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short message associated with said given location indicator being displayed on said given mobile terminal when said given mobile terminal enters said location.

5           31.    The method of Claim 30, further comprising, before said step of displaying, the step of:

          monitoring, by said organizational node, the location of said given mobile terminal.

10           32.    The method of Claim 18, wherein said given mobile terminal has an action database therein, and further comprising, after said step of displaying, the step of:

          moving, by said organizational node, said short messages displayed on said display of said given mobile terminal to said action list.

15           33.    The method of Claim 32, wherein each of said short messages within said action database has an additional respective indicator associated therewith.

          34.    The method of Claim 32, wherein said action database is within said memory.

20           35.    The method of Claim 18, wherein a given one of said short messages does not have one of said respective indicators associated therewith, said step of displaying being performed by said given short message being displayed on said display of said given mobile terminal without said indicator after additional ones of  
25           said short messages having respective indicators associated therewith are displayed.

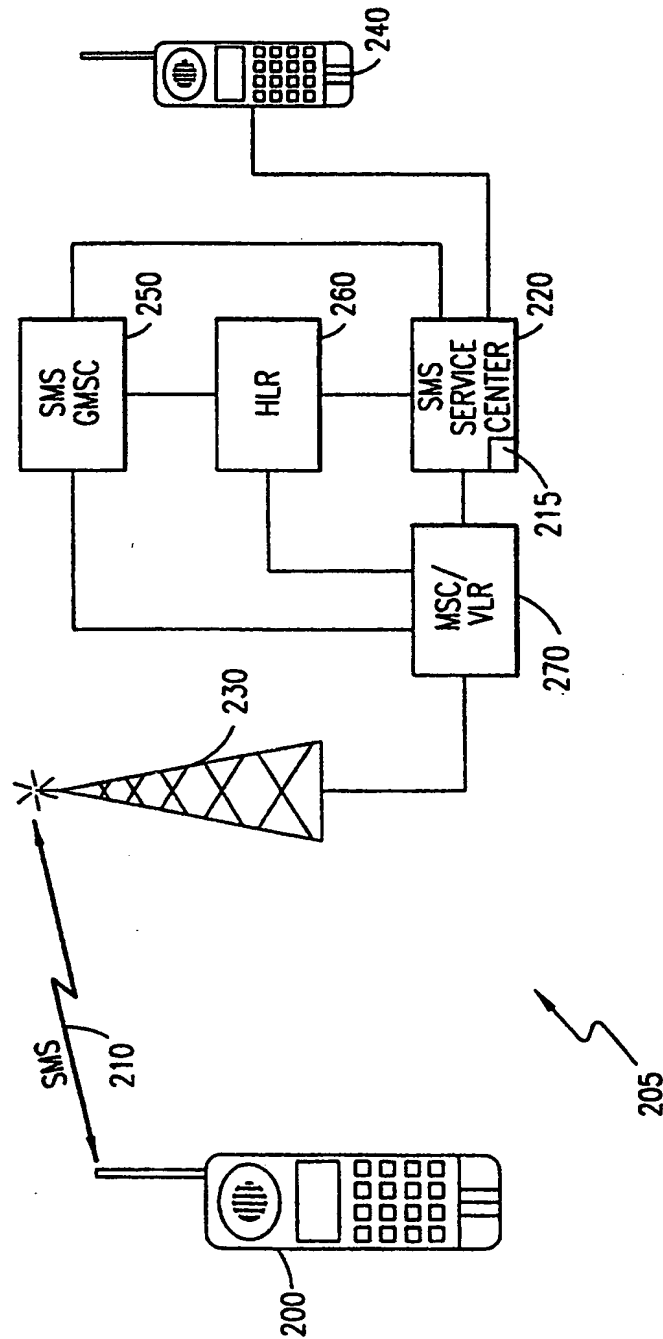
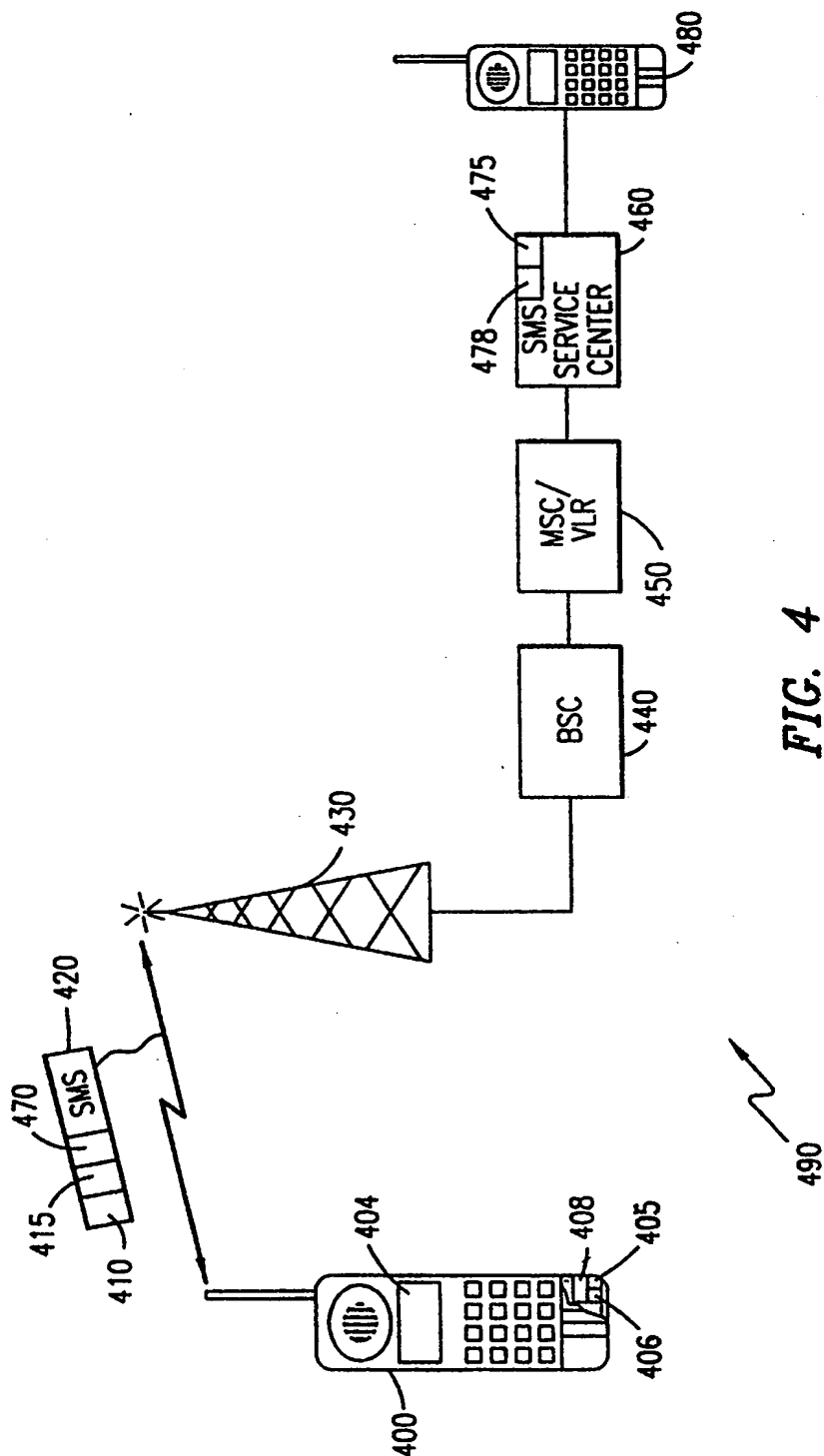


FIG. 2



# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 99/07075

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>WO 97 41654 A (MCLORINAN ANDREW GEORGE ;TSOUKAS GEORGE JAMES (AU); ERICSSON TELEF) 6 November 1997 (1997-11-06)</p> <p>page 8, line 15-31 -----</p>	<p>1,2,4,5, 9-13, 17-19, 21,22, 26-31,35</p>

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